

Course Type	Course Code	Name of the Course	L	T	P	Credits
DSC	NEEC103	Basics of Electrical Engineering - II	3	0	0	3

#### Course Objective

The main objective of the course is to impart basic knowledge of Electrical Power System, transformers and dc machines to the students, along with its applications. The course structure is prepared keeping in view of the applicability of the subject through numerical problems.

#### Learning Outcomes

Upon successful completion of this course, students will have:

- Basic knowledge of Electrical Power System.
- Basic knowledge about transformers and dc machines, and their applications.

Unit No.	Topics to be Covered	Lecture Hours	Learning Outcomes
1	<b>Introduction to Power System:</b> Structure: Generation, Transmission and Distribution, Conventional sources, Economics of power generation.	09	Understanding basic principles of power generation, transmission, and distribution.
2	<b>Single-phase Transformers:</b> Principle, Construction, Types, EMF equation, Equivalent circuit, Phasor diagram, Regulation, Efficiency.	10	Understanding the operation of single-phase transformers and their applications.
3	<b>DC Generators:</b> Working principle, EMF Equation, Types of excitations (separately excited, series, shunt, compound), Terminal characteristics.	10	Understanding the operation of different types of DC generators and their applications.
4	<b>DC Motors:</b> Working principle, Back EMF, Torque and speed equations, Performance characteristics, Types of excitations (separately excited, series, shunt, compound).	10	Understanding the operation of different types of DC motors and their applications.
5	<b>Applications:</b> Single-phase transformers, DC generators and DC motors.	03	Understanding the applications of single-phase transformers, DC generators and DC motors.

#### Text Books

1. Power System Engineering – D. P. Kothari and I. J. Nagrath (Tata McGraw Hill), 2<sup>nd</sup> Edition, 2015.
2. Electric Machines – D. P. Kothari and I. J. Nagrath (Tata McGraw Hill), 5th Edition, 2017.

#### Reference Books

1. Electrical Machinery – P. S. Bimbhra (Khanna Publ.), 2021.
2. Electric Machinery – A. E. Fitzgerald, Charles Kingsley Jr., S. D. Umans (McGraw Hill).